SUPPLEMENTAL BIOLOGICAL OPINION

ON THE

ANNUAL OPERATING PLAN

FOR

THE MISSOURI RIVER MAIN STEM RESERVOIR SYSTEM

DURING THE PERIOD MAY 1 - AUGUST 15, 2003

for the

Endangered Pallid Sturgeon (*Scaphirhyncus albus*),

Endangered Interior Least Tern (*Sterna antillarum*),

Threatened Northern Great Plains Population of the Piping Plover (*Charadrius melodus*),

Threatened Bald Eagle (*Haliaeetus leucocephalus*),

and

Designated Critical Habitat for the Piping Plover

April 21, 2003

U.S. Fish and Wildlife Service
Mountain-Prairie Region
Region 6
Denver, Colorado

U.S. Fish and Wildlife Service
Great Lakes-Big Rivers Region
Region 3
Fort Snelling, Minnesota

INTRODUCTION

This document is the U.S. Fish and Wildlife Service's (Service) supplement to the 2000 biological opinion issued to the Corps of Engineers (Corps) in November 2000 on the Operation of the Missouri River Main Stem Reservoir System, Operation and Maintenance of the Missouri River Bank Stabilization and Navigation Project and the Operations of the Kansas River Reservoir System.

This supplement is based on our review of the Corps' proposed revisions to the 2003 Annual Operating Plan (AOP) (i.e., operations from May 1 - August 15, 2003) in response to moderate-to-severe drought conditions throughout the Missouri River Basin; the Corps' associated supplemental biological assessment dated January 22, 2003; the Corps' March 14, 2003, response to the Service's request for additional information; and the Corps' additional subsequent supplemental biological assessment and revisions to the 2003 AOP dated April 4, 2003. Furthermore, this supplemental biological opinion represents a collaborative effort on behalf of our agencies.

This supplemental biological opinion addresses the effects of the Corps' revised proposed operation of the Missouri River System on the endangered pallid sturgeon (*Scaphirhyncus albus*), endangered Interior least tern (*Sterna antillarum*), threatened Northern Great Plains population of the piping plover (*Charadrius melodus*), including designated critical habitat, and the threatened bald eagle (*Haliaeetus leucocephalus*). The Service acknowledges and concurs with the Corps determination that the proposed action is not likely to adversely affect the bald eagle.

This supplemental biological opinion is a consultation on the Corps' fine tuning of flow measures during the 2003 tern and plover nesting season based on current habitat conditions and recent reproductive success of those species in the project area. It further recognizes that the adaptive management component of the 2000 biological opinion is ". . . a process that allows regular modification of management actions in response to new information and to changing environmental conditions . . . [T]he Corps and the Service agree that subsequent resource management actions in the Missouri River shall be pursued within an adaptive management framework that embraces the uncertainties of ecosystem responses and attempts to structure management actions to best address those uncertainties, recognizing that learning is a critical outcome." (USFWS 2000).

The Corps, through consultation and with the assistance of the Service, is responsible for ensuring that the operation of the Missouri River System is not likely to jeopardize the continued existence of endangered and threatened species or adversely modify critical habitat.

This supplemental biological opinion was prepared as the result of collaborative deliberations between the Corps and the Service to address Missouri River Drought Operations which will occur from May 1 through August 15, 2003, which is a noted critical time period for federally listed endangered species and for authorized project purposes. This biological opinion considers

the following conditions that were not specifically considered during the section 7 consultation process that produced the 2000 Biological Opinion:

- Information suggests that the rate of sandbar/island habitat degradation since the habitat was created following the 1997 floods, has been slower than expected (pages 199-210 USFWS 2000). More importantly, the impacts to productivity due to loss of that habitat are not what we expected (pages 199-210 USFWS 2000). The birds have continued to have higher productivity (higher than the historic average) in spite of the declining rates of habitat. The historic average (based on 17 years of data) of fledge ratios for least terns is 0.71. In the last 5 years that fledge ratio has been surpassed (C. Kruse, pers. com. 2003, USACE April 4, 2003, additional supplemental biological assessment). The historic average (based on 17 years of data) of fledge ratios for piping plovers is 1.0. In the last 5 years that fledge ratio has been surpassed (C. Kruse, pers. com. 2003, USACE April 4, 2003, additional supplemental biological assessment).

- Piping plover and least tern fledge ratios outlined in the 2000 biological opinion have been met in 4 out of the past 5 years for piping plovers and the last 5 years for terns (USACE April 4, 2003, additional supplemental biological assessment).

- In 2003, the Corps will be creating additional least tern and piping plover nesting habitat on the Missouri River (USACE April 4, 2003, additional supplemental biological assessment).

- The drought has produced good least tern and piping plover habitat conditions on Lakes Sakakawea and Oahe that have enhanced the overall productivity for these species above what was previously recognized for these reservoirs (USACE January 22, 2003, supplemental biological assessment and April 4, 2003, additional supplemental biological assessment).

- Projected drought conditions during the 2003 tern and plover nesting season indicate that lower Missouri River tributary runoff will be significantly reduced (USACE April 4, 2003, additional supplemental biological assessment). In the 2002-2003 AOP, the Corps referenced “RCC Technical Report 2000-A” which indicated in years with below normal run-off upstream of the system, release requirements for navigation support have generally been higher than normal.

- A preliminary population modeling exercise, completed in 2002, for the Northern Great Plains piping plover detected no measurable impact 20 years after a one-time take of 100 fledglings (M. Larson and M. Ryan, pers. comm. 2002). However, the model showed that negative impacts on the population (over a 20-year period) did occur after repeated take. For example, modeled incidental take of from 20-200 fledglings every 3 years projected a 4-32 percent increase in the likelihood of quasi-extinction (less than 50 pairs) after 20 years. If incidental take was annual, the model showed the range of increase in probability to quasi-extinction was from 11-68 percent higher.

Additional information considered is documented in: (1) the Corps' January 22, 2003, supplemental biological assessments on the 2003 AOP and the Master Manual, (2) a March 14, 2003, Corps letter to the Service, (3) proceedings from collaborative deliberations among Service and Corps staff from March 19 - 28, 2003, and (4) an April 4, 2003, supplemental biological assessment on a revised proposed 2003 AOP (i.e., hybrid steady release/flow-to-target flow scenario).

This supplemental biological opinion recognizes the complexity of this large river system, and that various flow alterations may provide more immediate benefits to some listed species, while other alterations would benefit other listed species. Over the long-term, however, ensuring variable river flows and processes should provide the range of conditions necessary to support stable populations of all the species under consultation. Variability is essential to the integrity of the river ecosystem (Richter et al. 1998, Galat and Lipkin 1999, NRC 2002). Adaptive management is an important and effective way to address the need to increase variability and flexibility in river operations, taking maximum advantage of the inherent variability of precipitation and runoff within the river system. In recognition of these issues, the Corps has indicated to the Service that they wish to take another look at the long-term operations of the Missouri River and the long-term conservation and recovery needs of federally listed species in light of changes that have occurred since the November 2000 biological opinion and potential considerations for changes in the Missouri River Master Manual. The Corps and the Service may reinitiate section 7 formal consultation on Missouri River operations should those considerations and recent information meet the criteria for reinitiation under 50 CFR 402.16.

CONSULTATION HISTORY

All correspondence, conference calls, meetings, and information related to the initiation of consultation on the 2003 AOP and this supplement to our November 2000 biological opinion is provided in Appendix I. Note that Appendix II is referenced within Appendix I. Copies of correspondence received between July 16 and 19, 2002, from the Yankton Sioux Tribe, Bureau of Indian Affairs, and states of South Dakota and Nebraska are provided in Appendix III. Copies of correspondence received between April 1 and 11, 2003, from the Missouri River Natural Resources Committee and the state game and fish departments of Montana, Iowa, Kansas, Missouri, North Dakota, South Dakota, and Nebraska also are provided in Appendix III.

BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

Action Area

The Action Area, as described in the 2000 biological opinion, is incorporated here by reference.

Operation of the Missouri River System During May 1 - August 15, 2003

This section incorporates by reference the "Description of the Proposed Action" section in the Corps' April 4, 2003, additional supplemental biological assessment. This proposed action was developed during collaborative consultation discussions between the Corps and the Service to address 2003 Missouri River Operations during the period of approximately May 1 - August 15, 2003.

In summary, the Corps' revised proposed action for the 2003 AOP combines elements of the 30 thousand cubic feet per second (Kcfs) flat release and the flow-to-target option discussed in the final 2003 AOP released in January 2003. Selection of the revised proposed action for the 2003 AOP was based on the goals of minimizing the loss of Interior least tern and piping plover habitat and loss of eggs and chicks, to provide water conservation in the upper three reservoirs, and to minimize operation uncertainty for navigation. Based on discussions held between the Corps and the Service, the revised proposed action for the 2003 AOP is a hybrid between a flat release and a flow-to-target release. It starts with a release of 26 Kcfs or higher (if releases to meet downstream targets is greater than 26 Kcfs) from Gavins Point Dam, beginning when the listed least terns and piping plovers initiate nesting in early to mid-May. Immediately following the stabilization of the river stage at the 26-Kcfs-release level, a field survey will be conducted to determine if certain known low-lying sandbars are inundated at the 26 Kcfs level. It is preferable to inundate these known low-lying sandbars to minimize the future loss of nests/eggs/chicks, in case it is necessary to increase releases later in the nesting season. If the low-lying sandbars in question were not inundated by the 26 Kcfs release, an increase to no-more-than 27 Kcfs would be initiated and held steady until higher releases are needed to support downstream flow targets. The steady release will be initiated when the Missouri River Basin Water Management Division is notified by the Omaha District, Operations Division, Threatened and Endangered Species Section, that federally-listed birds have begun nesting. Also, this release will, if necessary, be increased if tributary inflow plus the 26- to 27-Kcfs Gavins Point Dam release falls below the level needed to meet downstream flow targets.

In their additional supplemental biological assessment, the Corps also described the rationale for the selection of the revised proposed action, as well as actions that they propose to implement or have implemented: 1) to comply with portions of the RPA and RPMs of the November 2000 biological opinion and 2) to minimize take. In summary, these actions include: improved coordination with real-time operational decisions, continuation of RPM's identified in the 2000 biological opinion, possible use of Kansas River reservoirs (i.e., Tuttle, Milford, and Perry) for navigation support, adjustments to hydropower peaking restrictions, and following the contingency plan for terns and plovers identified in the 2000 biological opinion. This plan

allows moving nests to higher sandbar/island elevations.

STATUS OF SPECIES/ENVIRONMENTAL BASELINE

The status of the species and the environmental baseline as they relate to the least tern, piping plover, and pallid sturgeon were updated in the Service's 2000 Missouri River Biological Opinion (USFWS 2000) and is included here by reference. New information gained on the least tern, piping plover, and pallid sturgeon since the 2000 opinion, listed below, was considered in preparing this supplemental biological opinion.

Pertinent new information for the least tern, piping plover, and pallid sturgeon includes: (1) 2000-2003 tern and plover population survey information, (2) Service compilation of science related to Gavins Point flow recommendations (June 27, 2002, document provided to the Corps, Appendix IV), (3) 2001 Piping Plover International Census, (4) documentation of pallid sturgeon larvae in the Yellowstone/Missouri River confluence area in August 2002, (5) over 13,500 one-year-old pallid sturgeon stocked in the Missouri River in 2002, (6) new literature on least terns, piping plovers, and pallid sturgeons reviewed since the November 2000 biological opinion (Appendix V), and (7) piping plover population modeling exercise (discussed in detail below). In summary, this information or actions further substantiate the conclusion presented in the November 2000 biological opinion on the status of listed species, the decline in the health of the Missouri River ecosystem, and the need for an institutional change in Missouri River management. This position is further reflected by those states that submitted letters on this consultation to the Service (Appendix III).

In 2002, a Northern Great Plains piping plover population modeling exercise was conducted to look at potential impacts of a one time take of piping plovers (M. Larson and M. Ryan pers. com. 2002). This exercise is the best available science on the impacts of one-time take, despite the model's assumptions, limited iterations of the data, and non-inclusion of baseline incidental take allowed by previous section 7 consultations for this species. The model assumptions included: 1) 16-38 percent of the piping plover pairs nest in riverine habitat (based on upper level of plovers on the river from the 1991 and 1996 International Piping Plover Censuses), 2) assumed no management to enhance piping plover reproduction, and 3) used median population sizes which are more conservative than mean numbers.

This model detected no measurable impact on the plover population 20 years after a one-time take of 100 fledglings. However, the model showed negative impacts on the population (over a 20-year period) if there is repeated take. Incidental take of 20-200 fledglings every 3 years (i.e., 7 times over 20 years) was also modeled and resulted in a 4-32 percent increase in the likelihood of quasi-extinction(less than 50 pairs remaining) after 20 years. If the take was annual, the range of increase in probability of quasi-extinction was from 11-68 percent higher.

Critical habitat designation

Since critical habitat for the Northern Great Plains breeding population of the piping plover was not designated until September 11, 2002, it was not previously addressed in the 2000 Biological Opinion. The Service is concurrently informally consulting with the Corps on the long-term operations of the Missouri River and the long-term conservation and recovery needs of federally listed species in light of changes that have occurred since the 2000 biological opinion and subsequent considerations for changes in the Missouri River Master Manual. Therefore, the Service will only address critical habitat as it relates to this specific revised proposed action for May 1 - August 15, 2003.

The Service designated critical habitat for the Northern Great Plains population of the piping plover on September 11, 2002 (67 FR 57638). Critical habitat is designated for 19 units comprised of prairie alkali wetlands and inland lakes and reservoirs totaling approximately 183, 422 acres (74,228.4 hectares), and 5 areas along portions of 4 rivers in the States of Minnesota, Montana, Nebraska, North Dakota, and South Dakota, totaling approximately 1,207.5 river miles (RM) (1,943.3 kilometers).

On that portion of the Missouri River in Montana, critical habitat was designated on Ft. Peck Reservoir (77,370 acres), and 125.4 miles of the Missouri River below Ft. Peck Dam (RM 1712.0 - RM 1586.6). In North Dakota, critical habitat includes 18.6 miles below Ft. Peck Dam (RM 1586.6 - RM 1540.0), 179 miles of river on Lake Sakakawea above Garrison Dam (RM 1540.0 □ RM 1389.0); 87 miles of river below Garrison Dam (RM 1389.0 - RM 1302.0) and 70 miles of river on Lake Oahe (RM 1302.0 - RM 1232.0). In South Dakota critical habitat includes 159.7 miles above Oahe Dam on Oahe reservoir (RM 1232.0 - RM 1072.3); 36 miles below Ft Randall Dam (RM 880.0 - RM 844.0); 32.9 miles on Lewis and Clark Lake (RM 844.0 - RM 811.1) above Gavins Point Dam; and 58.9 miles below Gavins Point Dam (RM 811.1 - 752.2).

Primary constituent elements of the Northern Great Plains population of the piping plover are those habitat components (physical and biological) that are essential for the biological needs of courtship, nesting, sheltering, brood rearing, foraging, roosting, intraspecific communication and migration. The primary biological constituent element that must be present at all sites is the suite of dynamic ecological processes that create and maintain piping plover habitat. Without these ecological processes, the physical components of the primary constituent elements would not be able to develop. These processes develop a mosaic of habitats on the landscape that provide the essential combination of prey, forage, nesting, brooding, and chick-rearing areas. On rivers, the physical primary constituent elements include: sparsely vegetated channel sandbars, sand and gravel beaches on islands, temporary pools on sandbars and islands, and the interface with the river. On reservoirs, the physical primary constituent elements include: sparsely vegetated shoreline beaches, peninsulas, islands composed of sand, gravel or shale, and their interface with the waterbodies.

The interactive nature of the biological primary constituent element and the dynamic ecological processes creates the physical primary constituent elements. On the Northern Great Plains, the suitability of beaches, sandbars, shoreline, and flats as piping plover habitat types also is

dependent on a dynamic hydrological system of wet-to-dry cycles. Habitat area, abundance and availability of insect prey, brood and nesting cover, and lack of vegetation are all linked to these watercycles. On rivers, one site becomes flooded and erodes away as another is created. More importantly, the high flows on rivers create a complex of habitats for feeding, nesting, and brooding (Pavelka 2002 and Vander Lee et al. 2002). The dynamic nature of rivers, as well as flow management of rivers that provides primary constituent elements, is important to long-term creation and maintenance of habitat for piping plovers.

EFFECTS OF THE FEDERAL ACTION

This section incorporates by reference the section entitled "Anticipated Effects of the Proposed Action for the 2003 AOP" in the Corps' April 4, 2003, additional supplemental biological assessment. Effects for the least tern, piping plover, pallid sturgeon, and piping plover critical habitat are summarized below. Because of moderate-to-severe drought conditions and the May 1 - August 15 scope of this consultation, this supplemental biological opinion focuses more on the effects of the proposed action on the least tern and piping plover.

In light of the current conditions that exist on the reservoirs and in the river reaches in 2003, the Corps developed a modified operating plan for the 2003 AOP outlined in the section entitled "Description of Proposed Action." The Corps' assessment of effects in its April 4, 2003, additional supplemental biological assessment are based on a comparative analysis between the proposed action and the 30 Kcfs flat-release option identified in the final 2003 AOP. Some of the Corps' data was presented for four representative drought years during the 1987 to 1993 period. The Corps predicts that the revised proposed action will provide more least tern and piping plover habitat early in the nesting season and, through implementation of measures to minimize loss, will extend the time that effective habitat is available and/or will further enhance survival.

Interior Least Terns and Piping Plovers

Effects of the revised proposed action on least terns and piping plovers were evaluated by the Corps and the Service for the inundation of habitat, direct take of eggs and chicks, the potential loss of productivity from any changes in habitat availability, and the impact of conservation measures. A model was developed by the Corps to assess the expected effect of various operating scenarios on least tern and piping plover eggs and chicks on the Missouri River between Gavins Point Dam and Ponca, Nebraska. The goal of the modeling was to provide an indication of the level of impacts that might occur under modeled release scenarios. Details and discussion regarding the model structure and functionality are found in the Corps' January 22, 2003, supplemental biological opinion; the additional information letter to the Service dated March 14, 2003; and the additional supplemental biological assessment dated April 4, 2003.

The model incorporated least tern and piping plover population and productivity parameters data collected during the 2002 breeding census and productivity monitoring activities. Habitat

availability was determined using November 2002 habitat estimates that were developed by sampling the elevation and availability of nesting habitat on ten randomly selected sandbars along the Gavins Point Reach (see the Corps' supplemental biological assessment dated January 22, 2003; the additional information letter to the Service dated March 14, 2003; and the additional supplemental biological assessment dated April 4, 2003).

Specific habitat information is limited for the Fort Randall or Lewis and Clark Lake reaches (see page 26 of USACE, April 4, 2003, additional supplemental biological assessment). On Lewis and Clark Lake, only 2 sites are expected to provide potential tern and plover habitat in the 2003 nesting season. Both of these bars are low in elevation and by the end of the 2002 nesting season were degraded by vegetative encroachment and are not expected to support nesting birds in 2003. One of these sites only supported least terns and had poor nest success.

On the Fort Randall reach nesting occurred on six sites in 2002. Three of these sites are expected to be inundated under the proposed release. Two other sites will be reduced in size but did not produce well last year because of vegetative encroachment, therefore use of these sites is expected to be minimal. The sixth site produced the most birds in 2002 (42 of 102 nests) and is expected to be reduced in size under proposed flows. However, this site is sufficiently high enough in elevation that any nests threatened by flows can be moved higher, and chicks can escape to higher habitat.

In 2002, 26 eggs were removed for captive rearing to allow for increased flows in these two reaches. Of these 26 eggs, 9 piping plover and 10 least terns hatched and were released on sandbars. One tern egg did not hatch and two tern chicks died after hatching. Four eggs were addled. Because of the degradation in habitat on these reaches we anticipate that fewer eggs will be at risk in 2003 in comparison to 2002. Therefore, while a specific number of losses of nests or chicks on the Lewis and Clark Lake and Fort Randall reaches cannot be determined, any loss is expected to be minimal. Furthermore, we believe this take is small enough that it is accounted for within the range of take already identified for the Gavins Point reach.

A range of impacts to terns and plovers was derived by the Corps for 2003 by modeling a period of drought in 1988-1991, which is a period similar to the current drought. The Corps modeling did not provide a precise expectation of loss that would occur, but rather a summary of the range of potential effects that might occur for the flow options bounding the proposed action. Expected impacts of the revised proposed action for the 2003 AOP to least tern and piping plovers on the Missouri River between Gavins Point Dam and Ponca, NE, are shown in Table 5 below, an excerpt from the Corps' April 4, 2003, additional supplemental biological assessment. This reflects impacts from the revised proposed action which combines a flat flow of between 26 Kcfs and 27 Kcfs and subsequent flow-to-target scenario.

Table 5 - Expected Least Tern and Piping Plover Impacts of 2003 Revised Proposed Action for the 2003 AOP

	Least Tern		Piping Plover		Total	
Release	Eggs	Chicks	Eggs	Chicks	Eggs	Chicks
26 Kcfs						
1988	30	20	47	24	77	44
1989	8	0	23	4	31	4
1990	9	11	11	13	20	24
1991	7	14	15	25	22	39
27 Kcfs						
1988	19	16	30	18	49	34
1989	9	0	22	4	31	4
1990	2	2	8	3	10	5
1991	4	8	9	16	13	24

Actual values may vary from the estimated means by changes in the timing and magnitude of the expected flows, as well as differences in the least tern and piping plover productivity parameters and habitat selection assumed in the model.

The four representative drought years provide an opportunity to simulate the range of expected impacts due to the proposed release alternative. Starting releases at 26 Kcfs likely inundates low-lying sandbar habitat that likely would be at risk of inundation after nest initiation, with releases needed later to meet downstream water targets. The number of nests and chicks potentially inundated is dependant on the timing and magnitude of the tributary inflow that occurs during the rest of the nesting season. Depending on the conditions in 2003, losses for terns and plovers (eggs and chicks) are predicted to be between 15 and 121 individuals/birds.

Based on Table 1 and Figure 11 of the Corps' April 4, 2003, additional supplemental biological assessment, approximately 650-1,000 acres of usable (i.e., sparsely vegetated) habitat would be available on the river with the revised proposed action. Approximately 650-750 acres of habitat would be available with the flat 30 Kcfs operating plan in the Final AOP. The analysis in the November 2000 biological opinion suggests that approximately 1,200-1,750 acres of habitat would be available under the summer flow scenario of the Gavins Point RPA. Elevations on Lake Oahe and Lake Sakakawea have dropped 18 and 10 feet respectively since 2000. This change in elevations has exposed more potential habitat for the birds and resulted in fledge ratio goals being met over the last few years. Although absolute data are not available, the Corps best information suggests that the drought has exposed approximately 36,784 acres of shoreline habitat on Lake Sakakawea and 64,820 acres on Lake Oahe. The Corps believes that

approximately 5 percent of this habitat (i.e., about 1,840 acres on Lake Sakakawea and 3,241 acres on Lake Oahe) is suitable tern and plover nesting habitat (C. Kruse, pers. comm. 2003).

Figures 12 and 13 of the Corps' April 4 additional supplemental biological assessment show the data computed by the least tern and piping plover models, respectively, on the percent success of the chicks fledging, assuming 1988 release requirements for the revised proposed action. The figures also include nest initiation and successful hatching from these nests based on historical database numbers. This data indicates that providing larger areas of suitable habitat early in the nesting season results in higher productivity levels. This habitat, coupled with the habitat on the river below Garrison Dam and the abundant habitat on the reservoirs this year, should provide sufficient habitat to meet the fledge ratio goals outlined in the November 2000 biological opinion for the least tern (0.70) and the piping plover (1.13). The Corps' April 4, 2003, additional supplemental biological assessment indicates that the 3-year running average fledge ratio can be met in 2003 with virtually no reproduction and recruitment in 2003.

Through intensive nest monitoring activities, outreach and enforcement, predator management, and development of additional emergent sandbar habitat, the Corps proposes to minimize losses of nests and eggs, to offset losses due to declining habitat conditions in 2003.

Piping Plover Critical Habitat

Impacts to designated critical habitat from the proposed operating plan in 2003 will depend on the actual operating conditions that occur in 2003, but will be limited to those critical habitat areas designated in the riverine habitats below Gavins Point and Ft. Randall Dams, and on island habitats on Lewis and Clark Lake. The 2000 biological opinion (RPA II(A), page 233) called for summer flow modifications by 2003 for steady and then declining flows during the plover nesting season. The Service further envisioned that during drought years that flows would decline for water conservation purposes. However, as discussed previously, conditions not considered during the 2000 consultation process (e.g., new information concerning habitat degradation following 1997 floods; drought conditions and flow scenario impacts) have allowed the Service and the Corps to consider a different alternative to meet all operational purposes in 2003, and to serve as an acceptable substitute for this year's drought conditions for the low summer flow component of the RPA in the November 2000 biological opinion. The proposed modified operating plan will actually provide an increase in the availability of critical habitat early in the nesting season when compared to a flat 30-Kcfs flow as proposed in the final AOP, but less total habitat later in the season, than a steady to declining flow where critical habitat would increase during the nesting season. Specific habitat acreages for flow scenarios considered and the proposed operating plan (i.e., 26 Kcfs Minimum Risk) are identified in Table 1 and Figure 11 in the Corps' additional supplemental biological assessment dated April 4, 2003.

The revised proposed action will likely affect the primary constituent elements of the critical habitat. Under the proposed modified operating plan the biological processes that affect physical habitat will be adjusted away from the natural hydrograph (i.e., declining summer flows), potentially decreasing available habitat in the hatching and brood rearing season if higher flows

are needed to meet operational purposes. Although data analysis shows that this is likely the case (refer to model efforts and acreage numbers in Table 1 and Figure 11 in the Corps' additional supplemental biological assessment dated April 4, 2003) under the revised proposed operating plan, models project between 650 and 1000 acres of habitat may be made available early in the nesting season whereas approximately 650-750 acres of habitat would be available under a flat 30 Kcfs flow release in the final AOP The availability of this amount of habitat early in the nesting season should encourage early nesters. These nests tend to have higher nesting success.

The Service does not believe that the proposed action will appreciably reduce the value of critical habitat for the survival and recovery of the Northern Great Plains breeding population of the piping plover. This is due to: (1) the short duration of impacts to critical habitat, (2) the habitat measures already being implemented under management actions to comply with the RPA in the November 2000 biological opinion, (3) naturally expanding habitat (i.e., the 2003 drought conditions) on reservoir shorelines of Fort Peck Lake, Lake Sakakawea, and Lake Oahe, and (4) large total amount and present good condition of designated critical habitat for the Northern Great Plains breeding population.

Pallid Sturgeon

The effects to pallid sturgeon during this short duration (May 1 - August 15), one-time operation are difficult to assess. The Corps indicates the models that assess impacts to shallow water habitat are not sensitive enough to discern an effect of the flow portion of the revised proposed action on pallid sturgeon. For the reasons set forth below, the Service agrees that one-time operation of the Missouri River system pursuant to the revised 2003 AOP is not likely to increase impacts to the pallid sturgeon in excess of those anticipated by the 2000 biological opinion's RPA.

Based on current reservoir elevations and projected inflows, a spring rise on the lower Missouri River would not be required under the RPA in the 2000 biological opinion (pages 234-235 USFWS 2000). Therefore, the revised 2003 AOP, which does not provide for a spring rise in 2003, is consistent with this portion of the 2000 biological opinion.

In addition, actions taken by the Corps to meet the RPA and RPMs of the November 2000 biological opinion, including the creation of 2000 acres of shallow water habitat by 2005, will contribute to the existing habitat base for the pallid sturgeon. Focused research and population assessment studies in 2003 referenced in the April 4, 2003, additional supplemental biological assessment, will provide better information on which to base future management decisions. Population augmentation activities in 2003 will help ensure recruitment of hatchery-reared pallid sturgeon into the wild population until natural reproduction and recruitment is documented as self-sustaining. As documented in the April 4, 2003, additional supplemental biological assessment, the Corps is a significant contributor to these efforts. Therefore, we believe the effects of the revised proposed action fall within the scope of effects covered in the 2000 biological opinion.

CUMULATIVE EFFECTS

Cumulative effects in the action area were addressed in the November 2000 biological opinion and are included here by reference. The Service is not aware of any new information indicating those effects have significantly changed in a way that would affect our analysis of project operation during May 1 -- August 15, 2003.

CONCLUSION

The November 2000 biological opinion on the Missouri River Projects continues to be the controlling biological opinion concluding that the long-term operation of the Missouri River Projects under the CWCP results in jeopardy to the species. While jeopardy to the species identified in the November 2000 biological opinion remains, after reviewing the current status of the species, the effects of the revised proposed action, and the cumulative effects, the Service has concluded that the revised proposed operation (i.e., 26-27 Kcfs flat release with subsequent flow-to-target) for the period from May 1 through August 15, 2003, in combination with all other aspects of the RPA from the November 2000 biological opinion, is a suitable replacement for the summer low flow component of the RPA for that time period only. Furthermore, the revised proposed action will not result in destruction or adverse modification of critical habitat for the piping plover for this time period only. This conclusion is specific to the 2003 operating year with the understanding that future operations will be consistent with the November 2000 biological opinion or an operational alternative (i.e., new Master Manual) provided by the Corps that removes jeopardy. All aspects of the November 2000 opinion not addressed by this revised proposed action remain in effect and must be implemented.

The Service reached this conclusion for the following reasons, in addition to those discussed above:

1. The Corps has documented progress on the implementation of the RPA and RPMs of the November 2000 biological opinion (USACE 2002).

2. The revised proposed action includes 13 conservation measures identified in the April 4, 2003, additional supplemental biological assessment to be implemented by the Corps in 2003 to minimize losses of the birds and additional actions (specific to the 2000 biological opinion) related to the tern, plover, and pallid sturgeon.

3. Habitat available on the reservoirs, combined with the Corps' conservation actions associated with the revised proposed AOP, should be sufficient for birds to achieve production and fledge ratio goals in 2003 as outlined in the 2000 biological opinion.

4. Impacts to piping plover critical habitat are temporary in nature and short in duration.

5. Impacts to pallid sturgeon are indiscernible because the impacts are short-lived and temporary in nature.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA, provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be undertaken by the Corps so that they become binding conditions of any grant or permit issued to an applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps fails to assume and implement the terms and conditions, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the Corps must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR 402.14(i)(3)].

These RPMs are determined to be necessary to minimize take from the actions based on the Service's current understanding of the species status. Through an adaptive management process, the incidental take statement, the RPMs, and the terms and conditions may be modified on an annual basis, or as otherwise determined through the ACT.

Amount or Extent of Take Anticipated

No take for pallid sturgeons beyond that described in the 2000 biological opinion is anticipated, and therefore no additional take is authorized in this supplemental biological opinion.

This take statement applies only to incidental take of least terns and piping plovers resulting from the proposed flow modification for Missouri River operations for the time period of May 1 -- August 15, 2003. This supplemental opinion recognizes the ongoing implementation of the

RPA and RPMs as efforts to offset jeopardy and minimize take as described in the 2000 biological opinion. The Service has noted certain discrepancies in the figures provided in Tables 1 and 5 of the Corps' April 4, 2003, additional supplemental biological assessment regarding effects to terns and plovers. Based on personal communication with Mr. Casey Kruse on April 15, 2003, information in Table 5 of the Effects Section of that document is correct. On the basis of those revised figures, the Service anticipates direct take associated with the revised proposed action (i.e., 26 Kcfs flat/ flow-to-target release) of approximately 8-50 least terns (7-30 eggs and 0-20 chicks) and 24-71 piping plovers (11-47 eggs and 4-25 chicks). At the 27 Kcfs flat/flow-to-target revised proposed scenario, the Service anticipates take of approximately 4-35 least terns (2-19 eggs and 0-16 chicks) and 11- 48 piping plovers (8-30 eggs and 3-18 chicks). That take is in the form of direct take through nest inundation and harm and harassment because of reduced suitable habitat and reproductive success. Based on the documentation provided in this supplemental biological opinion, the effects of this take are encompassed within the anticipated level of take identified in the November 2000 biological opinion.

The Service agrees with the Corps' assessment of the application of the Corps' Captive Rearing Facility. Captive rearing will not be used as a management tool to avoid incidental take for the following reasons: 1) the "History of Captive Rearing for Interior Least Terns and Northern Great Plains Piping Plovers as it Relates to Intent" (Appendix VI), 2) the conflicts that the Captive Rearing Facility presents to the Service's Controlled Propagation Policy (Appendix VII), 3) the lack of addressing the issue of captive rearing in these species' Recovery plans, and 4) the impending initiation of a review of captive rearing for these species by the Conservation Breeding Specialist Group proposed for Summer 2003. However, consistent with the "Contingency Plan for Protection of Least Tern and Piping Plover Nests and Chicks" (Appendix VIII) identified in the November 2000 biological opinion, captive rearing may be considered to minimize direct mortality associated with the application of the flood control criteria in the Current Water Control Plan. Any decision to do so must be made in consultation with the Service.

Effect of the Take

The Service finds that the revised proposed action will lead to incidental take of endangered Interior least terns and threatened piping plovers and their habitats. The anticipated take of eggs and chicks is estimated to comprise only a small portion of 2003 production on the Missouri River. For example if we compare the anticipated take of eggs and chicks to 2002 production levels (birds fledged) it would only equate to 1-7.5 percent of the least terns and 1-4.5 percent of the piping plovers. This level of take for the Interior least tern population and the Northern Great Plains population of the piping plover falls within the level considered in the November 2000 biological opinion for these species. This level is measured, in part, by availability of habitat, population numbers, and productivity in terms of fledge ratios (birds fledged per pair) for these species (i.e., 0.7 birds fledged per pair for least terns and 1.13 birds fledged per pair for the piping plover). This determination is consistent with the November 2000 biological opinion.

Reasonable and Prudent Measures to Minimize Take

We believe the following reasonable and prudent measures with associated terms and conditions are necessary to minimize impacts of incidental take to these species:

1. Continue monitoring islands/sandbar habitats occupied by least terns and piping plovers. Adjust flows to proposed modified flow levels at the first sign (i.e., eggs present) of nesting by either of these species on the Gavins Point or Ft. Randall reaches.

2. Coordinate closely with the Service's North Dakota Field Supervisor and identify as soon as possible when the Corps identifies the need to increase flows to meet minimum service navigation flow targets. Discussions should include alternatives to minimize impacts.

3. Follow "Contingency Plan for Protection of Least Tern and Piping Plover Nests and Chicks" (Appendix VIII) to minimize nest and chick loss.

4. Implement all minimization of take methods identified in the Corps' April 4, 2003, additional supplemental biological assessment in close coordination with the Service's North Dakota Field Supervisor.

5. Assess historic operation on take and measures to reduce it.

Terms and Conditions for Implementation of Reasonable and Prudent Measures

When incidental take is anticipated, the terms and conditions must include provisions for monitoring to report the progress of the action and its impact on the species (50 CFR 402.14 (i)(3).

1. All monitoring shall continue as identified in the 2000 biological opinion (RPM 1). The Corps will coordinate with and update the Service's North Dakota Field Supervisor or designated staff person with all monitoring information via telephone every 2 days from April 23 - September 1, 2003.

2. Flow monitoring information will be provided to the Service's North Dakota Field Supervisor or designated staff person prior to the Corps' increasing flows to meet navigation service targets.

3. The Corps shall closely monitor and document all efforts related to implementing the "Contingency Plan for Protection of Least Tern and Piping Plover Nests and Chicks." These efforts also will be closely coordinated with the Service's North Dakota Field Supervisor.

4. The Corps shall complete by September 30, 2003, the review of historic operation on take of terns and plovers as specified in Terms and Conditions for RPM 2 in the November 2000 biological opinion. That information is critical in assessing current management opportunities and effects of management measures on these species.

CONSERVATION RECOMMENDATIONS

This section incorporates by reference the Conservation Recommendation section of the November 2000 biological opinion.

REINITIATION NOTICE

This concludes formal consultation on the actions outlined in the Corps' initial request and supplemental biological assessment, dated January 22, 2003, its additional information of March 14, 2003, and the additional supplemental biological assessment dated April 4, 2003. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount and extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

LITERATURE CITED

Galat, D.L. and R. Lipkin. 1999. Characterizing the natural flow regime of the Missouri River using historical variability in hydrology. Final Report to Missouri Department of Conservation, Columbia, MO. 67pp + appendices.

Natural Research Council. 2002. The Missouri River ecosystem: exploring the prospects for recovery. A report prepared by a Committee on Missouri River Ecosystem Science, Water Science and Technology Board. National Academy Press, Washington, D.C. 147pp.

Palvelka, G.A. 2002. Least tern and piping plover response to the 1995-1997 flood event on the Missouri River. Presentation at the 6th Annual Missouri River Conference. Sioux City, NE.

Richter, B.D., J.V. Baumgartner, D.P. Braun, and J. Powell. 1998. A spacial assessment of hydrologic alteration within a river network. Regulated Rivers: Research and Management 14: 329-340.

Vander Lee, B.A., C.D. Kruse, and G.A. Pavelka. 2002. Emergent sandbar trends below Gavins Point Dam. Presentation at the North American Plover Species at Risk Workshop. Ann Arbor, MI.

USACE.2002. 2001 Annual report - implementation of the biological opinion for the Missouri River Main Stem System, Missouri River Bank Stabilization and Navigation Project, and Kansas River Reservoir System. U.S. Army Corps of Engineers, Omaha and Kansas City Districts.

USFWS. 2000. Biological Opinion on the Operation of the Missouri River Mainstem Reservoir System, Operation and Maintenance of the Missouri River Bank Stabilization and Navigation Project, and Operation of the Kansas River Reservoir System. United States Fish and Wildlife Service, Denver, CO and Fort Snelling, MN. 285pp + Literature and Appendices.

PERSONAL COMMUNICATION

Kruse, Casey. pers. comm. 2003. Endangered Species Biologist, USACE, Yankton, SD.

Larson, Michael and Mark Ryan. pers. comm. 2002. University of Missouri, Columbia.